

What Is Claimed Is:

1. A radar system for motor vehicles (16), comprising at least one radar sensor (22, 24) for monitoring the area surrounding the motor vehicle, in particular the traffic in an adjacent lane (10, 14; 50), wherein the radar sensor (22, 24) has a phase-controlled antenna (36) and a control device (40, 42) for setting a plurality of radar lobes (26, 28; 30, 32; 26', 28'; 44; 46, 48) having differing geometries.
2. The radar system as recited in Claim 1, wherein the control device (40, 42) is designed to simultaneously generate at least from time to time at least two radar lobes (26, 28; 30, 32; 26', 28'; 46, 48) having differing directions of emission.
3. The radar system as recited in Claim 2, wherein the radar lobes (26, 28; 30, 32; 26', 28') are of different sizes.
4. The radar system as recited in Claim 3, wherein the larger (26; 30; 26') of the two radar lobes is oriented obliquely toward the rear and side with respect to the longitudinal direction of the vehicle (16) and the smaller radar lobe (28; 32; 28') is oriented to the side with respect to the longitudinal direction of the vehicle.
5. The radar system as recited in Claim 2, wherein the radar lobes (46, 48) are of roughly the same size and one (46) of them is oriented approximately toward the rear with respect to the longitudinal

direction of the vehicle and the other (48) is oriented obliquely toward the rear and to the side.

6. The radar system as recited in one of the preceding claims,
wherein the control device (40, 42) is designed to generate different configurations of radar lobes (26, 28; 44; 46, 48) in succession over time.
7. The radar system as recited in Claim 6,
wherein the configuration of radar lobes (26, 28) generated at a first instant is rotated by a specified angle relative to a configuration of radar lobes (26', 28') generated at another instant.
8. The radar system as recited in Claim 6,
wherein the configurations of radar lobes (26, 28; 44; 46, 48) generated successively over time differ with regard to the number of separate radar lobes.
9. The radar system as recited in Claim 8,
wherein the control device (40, 42) is designed to alternately generate a configuration having two radar lobes (26, 28; 46, 48) and a configuration having just one radar lobe (44), the one radar lobe being located approximately on the bisector of the two radar lobes of the other configuration.
10. The radar system as recited in one of the preceding claims,
wherein the control device (40, 42) is designed to vary the direction of emission of the radar lobes as a function of the curvature of the road.